**Memorandum**

To: Co Worker

From: Peter Lander

Date: September 23, 2013

Re: Results of isotherm model fitting

**OBJECTIVE**

The objective of this analysis was to find the model that best fits the data provided, given the the choice of either a Linear or Freundlich isotherm model.

**METHODS**

The data was used as input in KaleidaGraph and plotted, with the Dissolved Chlordane Concentration as the independent variable and the Adsorbed Chlordane Concentration as the dependent variable. Next, the two isotherm models were fit to the data set. The Linear (Eq. 1) and Freundlich (Eq. 2) models were then fit using the following equations:

(1)

(2)

Where q = mass of chlordane adsorbed per mass of adsorbent at equilibrium (mg/g)

K = Freundlich isotherm soil-water partition coefficient ((mg/g)(L/mg))

C = concentration of chlordane in the aqueous phase at equilibrium (mg/L)

= Freundlich isotherm intensity parameter (unitless)

**RESULTS AND DISCUSSION**

With both models fit to the data set it was clear that the Freundlich model was the most appropriate. In this case it was not necessary to conduct proper statistical tests for goodness of fit because of how well the model fit the data. The fitted model can be seen below in Figure 1 with the partition coefficient and intensity parameter noted on the Figure.



**Figure 1. Fitted Freundlich sorption isotherm for Chlordane concentration when water is**

K=245

**treated with GAC.**

**Appendix A: Raw Data**

**Table 1. Provided Sorption Data**

|  |  |  |  |
| --- | --- | --- | --- |
| Concentration of chlordane (mg/L) | Adsorbed Chlordane Concentration  (mg/g) | Concentration of chlordane (mg/L) | Adsorbed Chlordane Concentration  (mg/g) |
| 0 | 0 | 0.021 | 52.25 |
| 0.001 | 15.46 | 0.022 | 53.23 |
| 0.002 | 20.40 | 0.023 | 54.18 |
| 0.003 | 23.99 | 0.024 | 55.11 |
| 0.004 | 26.91 | 0.025 | 56.02 |
| 0.005 | 29.43 | 0.026 | 56.91 |
| 0.006 | 31.65 | 0.027 | 57.77 |
| 0.007 | 33.67 | 0.028 | 58.62 |
| 0.008 | 35.51 | 0.029 | 59.45 |
| 0.009 | 37.23 | 0.03 | 60.26 |
| 0.01 | 38.83 | 0.031 | 61.05 |
| 0.011 | 40.34 | 0.032 | 61.83 |
| 0.012 | 41.77 | 0.033 | 62.60 |
| 0.013 | 43.13 | 0.034 | 63.35 |
| 0.014 | 44.42 | 0.035 | 64.09 |
| 0.015 | 45.67 | 0.036 | 64.82 |
| 0.016 | 46.86 | 0.037 | 65.53 |
| 0.017 | 48.01 | 0.038 | 66.23 |
| 0.018 | 49.12 | 0.039 | 66.93 |
| 0.019 | 50.20 | 0.04 | 67.61 |
| 0.02 | 51.24 | --------- | -------- |